

Much more than guarding, safety is all in the design

About the author: *Frank Schrever has 24 years' experience in the instrumentation and automation markets and established Pilz Safe Automation, now Australasia's leader in safe automation products and services. Mr Schrever also sits on the AS 4024-1 review committee (SF041) and regularly trains WorkCover inspectors on machine safety and AS 4024-1.*

Safety and guarding might both be about protecting the worker, but Pilz Safe Automation believes that, in the real world, the two are poles apart.

The reason, according to Pilz Safe Automation CEO, Frank Schrever, is that guarding only distances the worker from an inherently dangerous machine. True safety is achieved through design and anticipates human error.

"Everyone does silly things without thinking from time to time," Frank said.

"A simple lapse of concentration shouldn't cost anyone their health or their life."

Research in 2003 by Australia's peak workplace safety authority, the National Occupational Health and Safety Commission (NOHSC), highlighted the role of design in safety. Analysing the cause of fatalities from 2000 to 2002, the study found 95% of deaths involving machinery and fixed plant were due, at least in part, to design issues. Poor design was slated as the primary cause of 42% of workplace fatalities.

Heading the list of design failures were rollover protective structures/seatbelts and guarding. Similarly, an analysis of injuries sustained during the 1997 to 2002 period showed design issues were once again involved in at least 42% of cases. The top three identifiable design problems were inadequate guarding, poorly situated control devices and inadequate interlock safety systems.

Delivering a paper at the 2004 Safety In Action conference, the NOHSC's Robert Pugsley said the statistics show a change of focus from worker accountability to safe design is needed.

Traditionally, workers have shouldered the blame for the removal of guarding, putting hands near moving parts, forgetting to turn on a safety system or using equipment inappropriately. Pointing to court judgements against machinery manufacturers and suppliers in these circumstances, Robert says the onus for such accidents must also be placed on the machine's designers.

What safe design means

The desirability of "safe design" is widely appreciated, but not universally understood. The NOHSC web site carries a definition that comprises five core principles:

- There is an understanding of the health and safety requirement of the design.
- There is systematic hazard identification and risk evaluation.
- Interaction occurs between people involved in the life cycle of the designed-product.

- Contractual arrangements and procurement systems operate to minimise purchased OHS risk.
- A sustainable designed-product results.

How to achieve safe design

Sharing the NOHSC view of safe design, Pilz Safe Automation says applying the principles in most manufacturing environments demands a holistic approach.

“Ideally, you design out the hazards during the machinery’s early development phases,” Frank Schrever said.

“In the real world however, you rarely have the luxury of collaborating at the design stage on safety issues and they often have to be retrofitted – adding the modifying engineer to the list of people with legal obligations that already includes the machine’s designer, manufacturer, supplier and owner.

“It’s equally as rare that the machine works in isolation – the safety system must accommodate the specific demands of your site and operations.”

The answer, he says, is either an automated safety system integrated with the operations controller that monitors and controls the safety response across large production areas or a local safety controller.

Pilz programmable safety systems (PSS) feed diagnostic and status information into the standard PLC’s and/or information displays for swift diagnostics.

“A PSS allows engineers to devise failsafe, logic-based protection for workers without sacrificing productivity,” Frank said.

“Rather than relying on people to follow protocols, sensors check everything is safe before access is allowed to hazardous zones. If something does go wrong, the message goes directly to the operations PLC, so the fix is immediate and safety remains intact.

“At the same time, you automate redundancy – sensors are checked for functionality continuously and backed-up in the event of failure.

“Guarding, whether you’re using a light curtain or a simple sheet-metal barrier, is half the safety equation. True safety is achieved when you have the right guarding in place and a control system watching over that guarding.

“And what makes for a successful safety system? It must do its job perfectly every time without relying on people doing the right thing – it’s only human to make mistakes, but safety systems simply can’t afford to.”

Automated safety systems will be on display at Pilz Safe Automation’s interactive stand at The Safety Show, which runs from 13-15 October, 2004.

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Pic attached: compact PSS.jpg

Suggested caption: Even the best guarding needs to be monitored by a failsafe system like the Pilz PSS in order to make a system safe.

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